REMARKS

This Application has been carefully reviewed in light of the Final Office Action mailed April 13, 2007. Applicants respectfully request reconsideration and favorable action in this Application.

Claims 1-13, 15-28, 30-31, and 43-46 are pending in the present application. In the Final Office Action, the Examiner rejected claims 1-13, 15-18, 20, 23-28, 30, 43, and 46 under 35 U.S.C. § 103(a) as being obvious over "Real-Time Workshop" by Simulink (referred to herein as "Simulink") in view of "The C++ Programming Language" by Bjarne Stroustrup (referred to herein as "Stroustrup"). Claims 21-22 and 44-45 were rejected under 35 U.S.C. § 103(a) as being obvious over Simulink in view of "Stroustrup" and further in view of U.S. patent 6,052,520 ("Watts").

Applicants respectfully submit that the Final Office Action has failed to present a *prima facie* case of obviousness. To establish a *prima facie* case of obviousness of a claimed invention, all the claim limitations "must be taught or suggested by the prior art" (MPEP §2143). As discussed below, the prior art, either alone or in combination, does not disclose all the claim limitations.

It may be helpful to reiterate certain aspects of the Applicant's invention prior to addressing the references cited in the Final Office Action. Independent Claim 1, as currently pending, recites the following:

> A computer system for simulating a physical system comprising:
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> a processor;
>
> memory coupled to the processor; and
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> object-oriented software in a main simulation system stored in the memory, the object-oriented software configured to:
>
> a) provide a logic interface to dynamically construct logic to customize simulation of transport phenomena through a model of the physical system;

b) convert the constructed logic into corresponding object-oriented code during a simulation without intervention of the simulator user;

c) integrate, without intervention of the simulator user, the object-oriented code with the main simulation system which comprises a simulation data model and simulation algorithms, resulting in an integrated simulation system, wherein the object-oriented code extends the simulation data model by creating new classes that inherit from the simulation data model, and the object-oriented code is configured to call functions of the integrated simulation system and use member data of the integrated simulation system; and

d) execute the integrated simulation system.

As discussed in at least the Background Section of the present application, prior to Applicants' invention there was a need by persons that performed simulation of a hydrocarbon-bearing reservoir associated with production facilities for an intuitive tool to capture a simulator user's custom facility management logic, turn that into executable code that is integrated with the reservoir simulator's code, and then execute the resulting system to predict the overall behavior of the reservoir during its lifetime (page 5, lines 9-12). Applicants were the first to find a solution to that problem.

The Examiner relied upon passages of Simulink for allegedly teaching specific aspects of the claimed subject matter. Because Simulink does not disclose object-oriented programming, the Examiner further relied on Stroustrup.

Simulink is a software package for modeling, simulating and analyzing dynamic systems utilizing a graphical user interface (GUI) for building models as block diagrams, using click-and-drag mouse operations. Simulink helps a computer programmer write "blocks" of procedural code using MATLAB, FORTRAN, C, or other languages that are <u>not</u> based on C++, and that do <u>not</u> support C++ or other object-oriented code.

To begin the analysis of Simulink and Stroustrup, certain features of Applicants' independent claims 1 and 20 and the Examiner's quotes from the cited references and his assertions are set forth below in a side-by-side presentation for ease of reference. Applicants' remarks thereto immediately follow.

<u>**Applicants' Claimed Subject Matter**</u>	<u>**Examiner's Quotes & Assertions in Final Office Action**</u>
" provide a logic interface to dynamically construct logic to customize simulation of transport phenomena through a model of the physical system "	"*The Real-Time Workshop, for use with MATLAB and Simulink, produces directly from Simulink models and automatically builds programs that can be run in a variety of environments, including real-time systems and stand-alone simulations*." (page 1-2, first paragraph)

While Simulink discloses a graphical user interface (GUI) for building models that "can run in a variety of environments, including real-time and stand-alone simulations," Simulink's disclosure of building models does not involve constructing logic to customize simulation of transport phenomena, much less converting constructed logic into object-oriented code.

<u>**Applicants' Claimed Subject Matter**</u>	<u>**Examiner's Quotes & Assertions in Final Office Action**</u>
"convert the constructed logic into corresponding object-oriented code during a simulation without intervention of the simulator user"	"*automatically builds programs . . .*" (page 1-2, first paragraph, of Simulink

Simulink's statement that its simulation "automatically builds programs" can not refer to building object-oriented code since Simulink is not based on object-oriented code.

Applicants' Claimed Subject Matter	**Examiner's Quotes & Assertions in Final Office Action**
"integrate, without intervention of the simulator user, the object-oriented code with the main simulation system which comprises a simulation data model and simulation algorithms, resulting in an integrated simulation system, . . ."	"*Seamless integration with MATLAB and Simulink*" (page 1-3 of Simulink, bulleted list), which the Examiner asserts comprises a simulation data model and simulation algorithms. "*how the generated model code is executed. The Real-Time Workshop generates algorithmic code as defined by your model. You may include your own code into your model via S-functions.*" (page 6-4 of Simulink, first paragraph).

Applicants' claimed invention results in object-oriented, logic code that integrates with existing, compiled end-user simulator system. The object-oriented, logic code is delivered to simulation end-users in the form of an executable program. In Simulink, the Simulink simulation created is the entire simulation. The Simulink simulation does not integrate with any existing simulator. The reference to MATLAB is misplaced because MATLAB is programming language for technical computing; MATLAB is not a simulator. The Examiner's assertion that the phrase "seamless integration with MATLAB and Simulink" comprises a simulation data model and simulation algorithms is also misplaced because the term "data model" as used in the present application is defined to mean "a collection of C++ classes", which requires object-oriented code.

Applicants' Claimed Subject Matter	**Examiner's Quotes & Assertions in Final Office Action**
"wherein the object-oriented code extends the simulation data model by creating new classes that inherit from the simulation data model, and the object-oriented code is configured to call functions of the integrated simulation system and use member data of the integrated simulation system"	"*An open and extensible architecture*" (page 1-3 of Simulink, bulleted list); "*Because Simulink is customizable, you can further simplify modeling by creating custom blocks and block libraries from continuous and discrete-time components.*" (page 1-10, fourth paragraph; "*All Simulink blocks are automatically converted to code, with the exception of MATLAB function blocks and S-function blocks that invoke M-files.*" (page 1-4, second paragraph); "*solver and data logging routines*" (page 6-4, figure 6-1, i.e. solver (algorithms) and data logs (data model) are present in the main simulation system, accessed via the Run-Time Interface.

Applicants' claimed subject matter extends the simulation data model. There is no teaching or suggestion in Simulink of extending the simulation data model by creating new classes, which can only be done using functionality of object-oriented code. Although Simulink refers to the simulation as having "extensible architecture" and the Simulink simulation is stated as being "customizable", these phrases in no way suggest object-oriented functionality. Simulink can not teach functional characteristics of an object-oriented environment since it is not object-oriented.

Applicants' Claimed Subject Matter	**Examiner's Quotes & Assertions in Final Office Action**
"execute the integrated simulation system."	. ". . . *automatically builds programs that can be run in a variety of environments* . . ." (page 1-2, first paragraph of Simulink) Simulink does not expressly teach that the software is object oriented. Stroustrup teaches object oriented code (page 726, last paragraph). Simulink and Stroustrup are analogous art because both are drawn to the generation of code. It would have been obvious to combine the teachings of Simulink and Stroustrup because traditional design methods (non-object oriented) are "less resilient to change, less amendable to tools, less suited for parallel development, and less suited for concurrent execution. Pg. 726 of Stroustrup, last Para.

There is no teaching or suggestion in Simulink of using object-oriented code. The Examiner's comments in the Final Office Action suggest that he believes that Simulink has the functionality of the claimed subject matter, and that one skilled in the art could read Stroustrup and rewrite Simulink in C++ to be object-oriented. Since Simulink does not disclose the fundamental capabilities of Applicants' claimed subject matter, persons skilled in the art would not take the Simulink disclosure and combine it with Stroustrup to arrive at Applicants' claimed subject matter. Applicants' claimed invention automatically, and without simulator user intervention, generates C++, and takes advantage of sophisticated object-oriented techniques. At best, Stroustrup states that traditional design methods (non-object-oriented) are less resilient to change, less amendable to tools, less suited for parallel development, and less suited for concurrent execution. This, however, is not teaching or suggesting the elements of Applicants' claimed subject matter, which are not disclosed in Stroustrup or Simulink, either alone or in combination.

In *KSR Int'l. Co. v. Teleflex, Inc.* (U.S. April 30, 2007), the Supreme Court did not totally reject the use of "teaching, suggestion, or motivation" as a factor in determining whether the claimed subject matter is obvious under 35 U.S.C. § 103(a). The Supreme Court recognized that a showing of "teaching, suggestion, or motivation" to combine the prior art to meet the claimed subject matter could provide helpful insight in the obviousness analysis. The Supreme Court specifically stated:

> "Often, it will be necessary . . . to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an <u>apparent reason</u> to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis <u>should be made explicit</u>." (underlining added)

Therefore, in formulating a rejection under 35 U.S.C. § 103(a) based on a combination of prior art elements as in the Final Office Action, it is necessary for the Examiner to identify the reason why a person or ordinary skill in the art would have combined Simulink and Stroustrup in the manner set forth in the Final Office Action. Applicants' respectfully assert that the Examiner has not met this obligation for at least the reasons presented above.

Claims 2-13, 15-19, 21-28, 30-31, 43-46 depend from independent claim 1 or independent claim 20 and are patentable for at least the same reasons set forth above.

Accordingly, in view of the remarks set forth above, Applicants' respectfully submit that the Final Office Action has failed to present a *prima facie* case of obviousness. Therefore, Applicants respectfully request that the Examiner withdraw the rejection and allow the pending claims 1-13, 15-28, 30-31, and 43-46.

CONCLUSION

The Applicants have made an earnest attempt to place this application in condition for allowance. For the foregoing reasons, and for other reasons clearly apparent, Applicants respectfully request full allowance of all pending claims.

No fees are believed to be required. If, however, any fees are required, the Commissioner is hereby authorized to charge any required fees to Deposit Account No. 05-1328 of ExxonMobil Upstream Research Company.

If the Examiner feels that a telephone conference would advance prosecution of this application in any manner, the undersigned attorney for Applicants stands ready to conduct such a conference at the convenience of the Examiner.

Respectfully submitted,

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Certification under 37 CFR §§ 1.8(a) and 1.10

I hereby certify that, on the date shown below, this application/correspondence attached hereto is being:

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